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all around, and the very broad central area occupied by irregular, more or less elongated reticulations. Thus the scale comes to closely resemble those of the Mormyridæ. As it now seems evident that the ancestors of the Teleosteans must have had reticulated scales, or at least that the ordinary radial sculpture is derived from the reticulated type, this *Moxostoma* scale must be regarded as uniquely primitive or atavistic for the general group to which it belongs.

3. Dr. G. A. Boulenger has very kindly sent me scales of the cæciliid amphibia *Ichthyophis glutinosus*. These are very small, embedded in the skin, cycloid in form. The pattern is extremely characteristic, consisting of concentric grooves connected at intervals by cross-lines, the whole effect being like that of bricks in a wall. The concentric grooves are probably not circuli, nor can I make out anything corresponding to the circuli of fishes. In parts of the scales, however, the markings become irregular, producing a reticulation which closely simulates that of the reticulate-scaled fishes. I believe that the scales are really comparable to fish-scales, and that the sculpture is the same as the radial sculpture of fishes. No fish scale has been seen resembling in detail that of *Ichthyophis*; such scales as those of *Chrosomus* are superficially similar, but owe their circular lines to different elements.¹

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NOTES ON THE GENUS *TYPHA* AND ITS NEMATODE
ROOT GALL—*HETERODERA RADICICOLA*
(GEEFF) MULL.

DURING the summer of 1908, while investigating some problems connected with the root system of *Typha latifolia*, I found a number of abnormal growths on the rootlets. These growths appeared as irregularly spherical or fusiform enlargements, varying in size from 1 to 5 mm. in diameter. They were identified by Professor Atkinson as root galls caused

¹ Since this was written, I have found that a deep-sea eel, *Synaphobranchus pinnatus*, has scales curiously similar to those of *Ichthyophis*.

by the nematode *Heterodera radicicola*. I have collected these galls at the same station (limnology station of Cornell University) three successive years, but have never found them on *Typha* in any other locality.

Professor Atkinson¹ thought, from his observations of this worm on potatoes and tomatoes, that, if favorable opportunity should occur for its introduction in the north, it might become a pest. Webber and Orton² say it will never become a serious pest in the north, as severe cold kills the worm. Van Hook³ reports the worm as wintering in ginseng beds which had been mulched and also in protected forest beds. This worm has been a serious pest to ginseng in the north.

Stone and Smith⁴ found the galls on outdoor plants, but concluded that they were transient.

The plants observed by me in the Cayuga marshes are located along the shore line of one of the arms of Fall Creek where moisture is plentiful in the soil all winter. Winter observations prove that the soil in which the galls are found does not freeze. None of the galls have been found more than eighteen inches below the surface.

L. N. HAWKINS

CORRELATION NOTES

In describing the fauna of the Moorefield shales of Arkansas¹ Mr. George H. Girty lists and describes the following fossils among others from the region: *Productus inflatus* var. *coloradoensis* Girty (?),² *Productus arkansanus* var. *multiliratus* Girty,³ and *Diaphragmus elegans* Norwood and Pratten.⁴ By a comparison of the figures of these fossils on plate iv.⁵ with fossils which the writer collected

¹ Bull. 9, Alabama Exp. Sta.

² U. S. Dept. Agr., Bur. Plant Ind., Bull. 17, 1902.

³ Cornell Agr. Exp. Sta., Bull. 219, 1904.

⁴ Bull. 55, Mass. Agr. Exp. Sta., 1898.

⁵ "The Fauna of the Moorefield Shale of Arkansas," U. S. Geol. Survey, Bulletin No. 439.

⁶ *Ibid.*, pp. 42-43.

⁷ *Ibid.*, p. 43.

⁸ *Ibid.*, pp. 51-52.

⁹ *Ibid.*, plate iv.

at Fort Apache, Ariz., in 1902, he finds that the three fossils mentioned are abundantly represented in the lower Red Wall there, especially in the limestone series that caps the formation on the mesas east of the North Fork of White River.⁶ Specimens of these species, collected from this region then, are to be found in the writer's collection in the Geological Museum of the University of Indiana. The finding of the similar fossils in the two districts would seem to indicate that the strata concerned are relatively of the same age.

ALBERT B. REAGAN

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SOCIETIES AND ACADEMIES

THE TORREY BOTANICAL CLUB

THE meeting of April 11, 1911, was held at the American Museum of Natural History at 8:15 P.M. Dr. E. B. Southwick presided.

The regular order of business was dispensed with and the announced lecture of the evening on "Poisonous Mushrooms," by Dr. W. A. Murrill, was then presented. The lecture was illustrated with many lantern slides. An abstract of the lecture prepared by the speaker follows. A more complete discussion of the subject by Dr. Murrill may be found in the November number of *Mycologia* for 1910.

"Considering its importance, it is remarkable how little is really known about this subject, most of the literature centering about two species, *Amanita muscaria* and *Amanita phalloides*, which have been the chief causes of death from mushroom eating the world over.

"As the use of mushrooms in this country for food becomes more general, the practical importance of this subject will be vastly increased, and it may be possible to discover perfect antidotes or methods of treatment which will largely overcome the effects of deadly species. This would be a great boon even at the present time, and there will always be children and ignorant persons to rescue from the results of their mistakes. Another very interesting field, both theoretical and practical in its scope, is the use of these poisons in minute quantities as medicines, as has been done with so

⁶ Reagan, Albert B., "Geology of the Fort Apache Region in Arizona," *American Geologist*, Vol. XXXII., pp. 265-308.

many of the substances extracted from poisonous species of flowering plants, and even from the rattlesnakes and other animals. Thus far, only one of them, the alkaloid muscarine, has been so used.

"The poisons found in flowering plants belong chiefly to two classes of substances, known as alkaloids and glucosides. The former are rather stable and well-known bases, such as aconitine from aconite, atropine from belladonna, nicotine from tobacco and morphine from the poppy plant. Glucosides, on the other hand, are sugar derivatives of complex, unstable, and often unknown composition, such as the active poisons in digitalis, hellebore, wistaria and several other plants.

"The more important poisons of mushrooms also belong to two similar classes, one represented by the alkaloid muscarine, so evident in *Amanita muscaria*, and the other by the deadly principle in *Amanita phalloides*, which is known mainly through its effects. Besides these, there are various minor poisons, usually manifesting themselves to the taste or smell, that cause local irritation and more or less derangement of the system, depending upon the health and peculiarities of the individual.

"The principal species of poisonous fungi were illustrated by colored lantern slides, the series containing *Amanita cothurnata* Atk., *Amanita muscaria* L., *Amanita phalloides* Fries, *Amanita strobiliformis* Vittad., *Clitocybe illudens* Schw., *Inocybe infide* Peck, *Panus stypticus* Fries, *Russ emetica* Fries, and several other poisonous species of interest."

THE meeting of April 26, 1911, was held in the museum building of the New York Botanical Garden at 3:30 P.M. Vice-president Barnhart presided.

The first number on the announced scientific program was a paper, on "Fern Collecting in Cuba," by Mrs. N. L. Britton. This paper is published in full in the *American Fern Journal*, Vol. I., p. 75.

The next number was a discussion of "Fern Venation," by Miss Margaret Slosson. A more complete discussion of the subject by Miss Slosson may be found in her book "How Ferns Grow."

The meeting then adjourned to the Fern House of the New York Botanical Garden under the guidance of Mrs. N. L. Britton for a further study of ferns.

B. O. DODGE,
Secretary